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STUDENT LESSON INTRODUCTION TO LAND NAVIGATION

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MOS 12B
COMBAT ENGINEER
SKILL LEVEL I

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FOR
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LESSON INTRODUCTION:

The ability to read a map for an Engineer Soldier is very important. In you support role to the Combat Arms (infantry, armor or artillery) you will often be told to go to a location that is not familiar to you. For example, you may be told to "Take your water trailer to coordinates 11508655 and pick up water for the company". To do what you are told, you must be able to read a map. You will find that being able to read a map has many advantages. It will make you a more valuable person to your unit and give you added confidence in your abilities.

Being able to read a map will help you answer these important questions:

- Where am I?

- Where am I going?

- How far is it?

- How do I get there? and

- How long will it take me?

When you can answer these questions you will have no problem in performing your mission. Your map is your friend and will help you answer all those questions, and will also tell you what type terrain (hills, valleys, swamps, open land, etc.) you must go through to get where you are going. You will be amazed at the information that is found on a map sheet.

Map reading is exciting. In this series of lessons you will learn how to:

Locate a point on a map (using grid coordinates).

Identify terrain features.

Measure ground distances.

Orient your map by terrain association and to;

Navigate using a map.

STUDENT PREREQUISITES: None.

MATERIAL NEEDED:

To work this lesson you will need:

A 1:50,000 Map of Tenino, Washington Paper (Two pieces of scratch paper)
Pencil (At least two)

If you do not have these items, get them from the lesson Manager before starting this lesson.

STUDY RESOURCES:

The references listed below were used to prepare this lesson and are available for your use anytime, except during testing. If you want to use a reference, ask the manager.

FM 21-26 Map Reading (Chapter 3)

TRAINING OBJECTIVE

TASK: Identify marginal information of a topographic map.

CONDITIONS: Given a 1:50,000 topographic map, paper, pencil, writing surface and a well-lit classroom.

STANDARDS: Students will demonstrate their ability to identify and use marginal information throughout the lessons on land navigation. Marginal information proficiency will be tested as integral parts of land navigation lessons.

The purpose of this lesson is to introduce you to the military topographic map, and the information that is found in the margin of a topographic map. When you finish this lesson, you will know what a map is and how to use and locate the following items of marginal information:

- Map Sheet Name
- Map Scale
- Map Edition
- Map Series
- Map Sheet Number
- Bar Scale
- Adjacent Sheet Diagram
- Legend
- Grid Reference Box

You will not be tested on marginal information at the end of this lesson. But you will need to know how to find and use marginal information to complete lessons on land navigation. Learn the information in this lesson and you will have no problems finding the information you need to complete other lesson assignments.

LESSON

Definition of a Map:

What is a map? A map is "a drawing of the earth's surface as seen from above, that has been drawn to scale. It can best be described as the picture you see when you look down on the ground from an airplane. The picture is scaled down (reduced in size) in order to cover a large area of the earth and to make the map more usable. The amount the picture is reduced is called the map scale. (The map scale will be discussed later in this lesson.)

There are different types of maps. Many maps are made to show only one type terrain feature such as roads. These maps are usually named for the one feature they show, as a "Road Map" shows the road network in an area. However, the military has a need to know much more than the road network. Military maps are called topographic maps. Topographic maps show many terrain features such as roads, railroads, houses, trees, ponds, rivers, swamps, hills, valleys and special buildings such as churches and schools. These features are shown by the use of symbols and colors. Map symbols and colors are discussed in the lesson on terrain features.

REMEMBER a map is a picture of the earth's surface as seen from above.

MARGINAL DATA: The information found in the margin of a map is called marginal data. The items of marginal data you will need to know are explained below. You will not be taught all items of marginal information, only those items you will need for these lessons. As you become more familiar with map reading in your unit, the other items of marginal information will be explained.

1. Map Sheet Name - The map sheet name is found at the top center of the map sheet. The sheet name of the map you have is Tenino. Find the sheet name of your map. The map sheet name is named from the main terrain feature on the map sheet. In this case it is the town of Tenino, Washington. The sheet name is an aid in finding the map sheet you are looking for. The sheet name along with the sheet number (found in the upper right hand corner of the map) and the series number (also found in the upper right hand corner) is like a set of fingerprints, they identify the exact map sheet you are looking for.

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2. Map Scale - (Figure 1): In the upper left hand corner of the map you will find the name of the state in which the map area is located and the scale to which the map is drawn. In this case the map is of the Tenino area of Washington state. The scale of the map is 1:50,000. This means that one measurement on the map equals 50,000 of that same measurement on the ground. As an example, one inch measured along the 4 lane highway on the left hand side of the map equals 50,000 inches on the ground or more than seven tenths of a mile actual ground distance. To help you measure ground distances, every map has a Bar Scale located at the bottom center of your map. Look and find the Bar Scale. The Bar Scale and its use is discussed in paragraph 5.

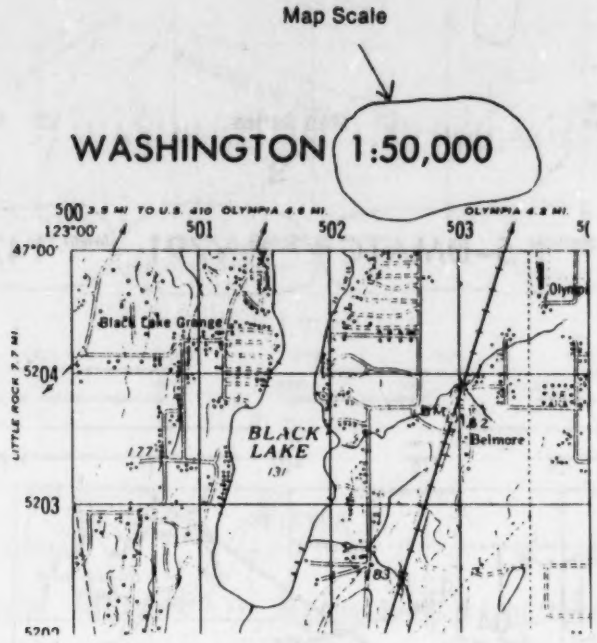

FIGURE 1

3. Map Edition - ((1) Figure 2) The map edition number is found at the top right of your Tenino map. As you can see the edition number is 5-DMATC. This number tells you that this is the 5th edition of this map sheet.

4. Map Series and Sheet Number - Next to the map edition is the Map Series Number ((2) Figure 2). The series of your tenino map is V791. Again the Roman numeral V, tells you this is the 5th series of this map sheet.

The Map Sheet Number is found at the top right of your map sheet ((3) Figure 2). In this case it is sheet number 1477 IV. This sheet number is used with the adjacent sheets diagram found at the bottom right of your map sheet. Find the adjacent sheets diagram on your map. As you can see your map sheet is outlined in heavy print on the adjacent sheet diagram.

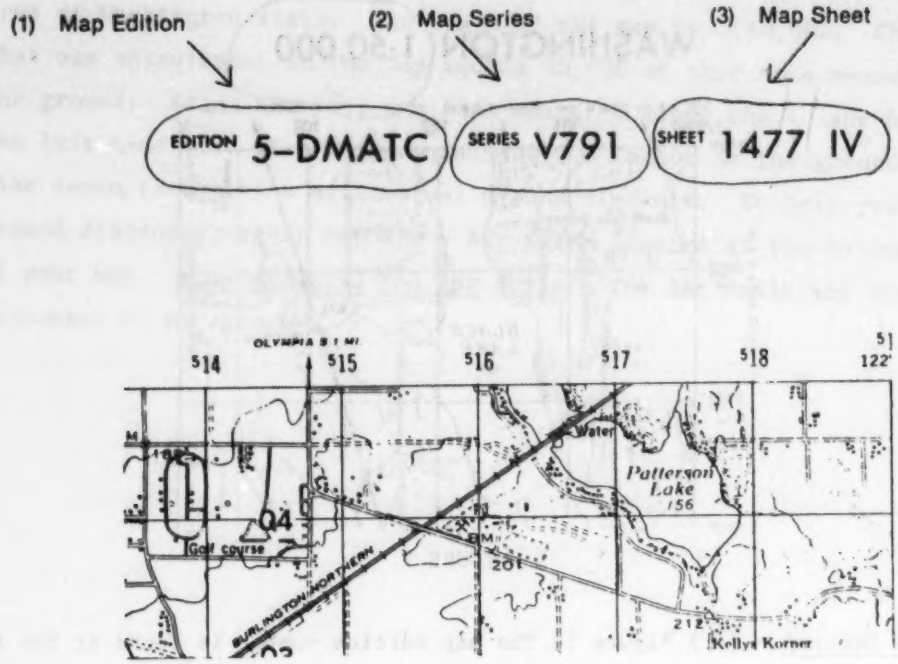

FIGURE 2

REMEMBER, The items of identification on a map sheet are found at the top of the map. They are (1) Map Name; (2) Map Scale and State; (3) Map Edition and (4) Map Sheet Number.

5. Bar Scale - (Figure 3): The Bar Scale is a ruler printed on the map on which distances on the map can be measured as actual ground distance. The bar scale is located at the bottom center of your map. The bar scale on the Tenino map has four different scales. These are (1) Statute Miles; (2) Meters; (3) Yards and (4) Nautical Miles. Measured distances on the map can be converted to any or all of these measurements. Use of the bar scale is explained in the lesson on distances.

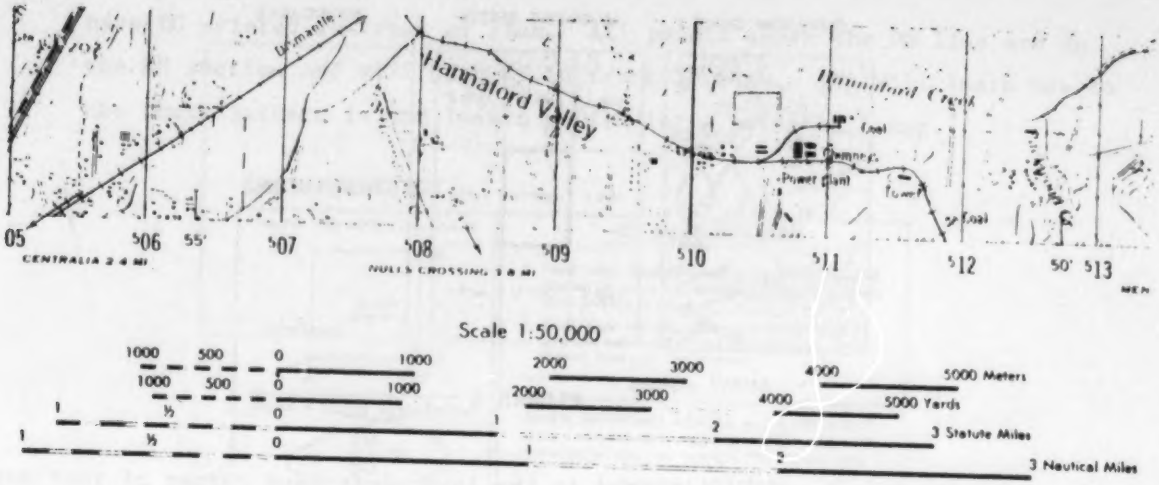

FIGURE 3

6. Adjoining Sheets - (Figure 4): At the lower right hand corner of your map you will find a drawing showing the maps sheets that surround your Tenino map sheet. As you can see, the Tenino map sheet is outlined in heavy print in the middle of the diagram and is sheet number 1477 IV. The maps surrounding the Tenino sheet are also numbered. This diagram shows the map sheet you need by it's number. For example, you are following highway 507 northeast out of the town of Tenino toward Clear Lake (right center of your map). After you leave Clear Lake you wish to follow highway 507 further. QUESTION: Looking at the adjoining sheets diagram, which map sheet must you get to continue your journey on highway 507?

ANSWER: Map sheet 1477I, of course. Did you get it? Here is another one. If you wanted to go north out of Tumwater on highway 99 (top left center of your map) you would need map sheet 1478III to determine where the road goes.

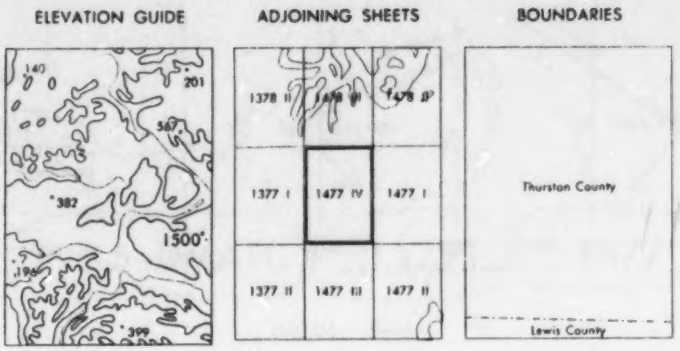

FIGURE 4

7. Legend - The legend is located in the lower left hand corner of your map. Find your legend now. As you can see the legend contains information on the meaning of colors, special buildings (churches, schools), the different types of railroads, boundaries, highway signs, and other special things you need to know to be able to read a map. When you find a symbol on the map that you are not familiar with, look it up in the legend. That is what the legend is for, to further explain items that appear on the map. Look at your legend and become familiar with the information that is found there.

8. Grid Reference Box - (Figure 5): The grid reference box is the last item of marginal information to be discussed in this lesson. The grid reference box is located at the bottom center of your map. It contains step-by-step instructions for using the grid your map covers and the military grid reference system. The alphabetical letters in the grid reference box tell you what 100,000 square meter grid square you are working in. At Figure 5, you see that there are two sets of letters EG and EH. This means that the map covers portions of two 100,000 square meter sections, the EH section and the EG section. Coordinates of points in the EG section will have the letters EG printed in front of them (Example, EG168997) and coordinates of points in the EH section have EH printed in front of them (Example, EH154005). When you learn to read coordinates, you will find out what is located at these two points.

Look along the left margin of your map sheet until you come to grid line 00. All coordinates below the 00 line are in the EG section and will

have EG printed in front of them. All points above the 00 line are in the EH section and will have EH in front of them. You will learn how to use these letters in the lesson on finding a point on a map.

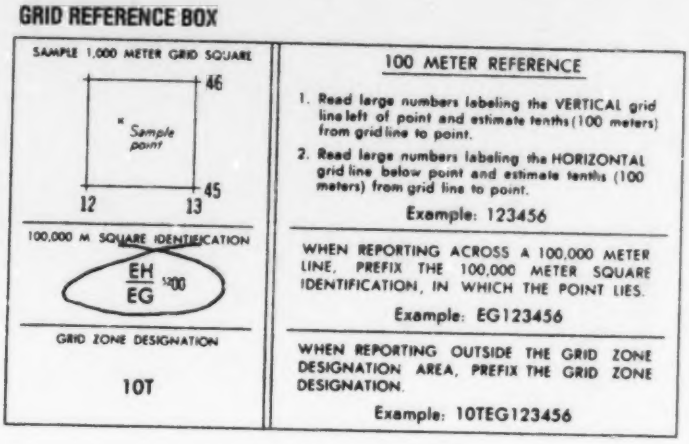
GRID REFERENCE BOX
SAMPLE 1,000 METER GRID SQUARE
46
Sample point
45
12
13
100,000 M SQUARE IDENTIFICATION
EH
EG
500
GRID ZONE DESIGNATION
10T
100 METER REFERENCE
1. Read large numbers labeling the VERTICAL grid line left of point and estimate tenths (100 meters) from grid line to point.
2. Read large numbers labeling the HORIZONTAL grid line below point and estimate tenths (100 meters) from grid line to point.
Example: 123456
WHEN REPORTING ACROSS A 100,000 METER LINE, PREFIX THE 100,000 METER SQUARE IDENTIFICATION, IN WHICH THE POINT LIES.
Example: EG123456
WHEN REPORTING OUTSIDE THE GRID ZONE DESIGNATION AREA, PREFIX THE GRID ZONE DESIGNATION.
Example: 10TEG123456

FIGURE 5

Before you go to the next lesson, work the following self-check exercise. Work the exercise from memory then check your map to see if you got the correct answers. Match the items of marginal information, to their location on the map margin. (Place your answers on a scratch piece of paper.)

MARGINAL INFORMATION	LOCATION
1. Bar Scale _____	A. Top Center
2. Adjoining Map Diagram _____	B. Bottom Center
3. Legend _____	C. Bottom Right
4. Map Sheet Name _____	D. Top Right
5. Map Sheet Number _____	E. Top Left
6. Map Scale _____	F. Bottom Left

If you answered 5 of the questions correctly, go the the next lesson. If you missed more than one question, restudy the lesson.

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